

REMARKSRegarding the Prosecution History:

Applicants are thankful for the Examiner's diligent efforts to advance this application to allowance and are pleased to have this opportunity to address the Examiner's remaining concerns. Upon careful review of the remarks presented in this reply, the Examiner will agree that the claimed invention is patentable and that this application is in good condition for allowance.

In the final Office Action of August 09, 2007, the Examiner rejected:

- I. Claims 1, 2, 10, 16, 17 and 23 under 35 U.S.C. §102(e) over *Govoni et al.* (US 6,413,477);
- II. Claims 1, 3, 4, 6, 10, 16, 18 – 20 and 23 under 35 U.S.C. §103(a) over *Govoni et al.* (US 6,413,477); and
- III. Claims 7, 8, 21 and 22 under 35 U.S.C. §103(a) over *Govoni et al.* in view of *Lubbock* (US 2,636,712).

Regarding Rejection I:

The Examiner should withdraw the rejection of claims 1, 2, 10, 16, 17 and 23 under 35 U.S.C. §102(e) over *Govoni et al.* (US 6,413,477).

The Examiner has maintained this rejection, stating that because the transitional phrase "comprising" is used in the claim, "the reference can include more than what is contained in the claim language."¹ This statement is perfectly true; however, the Examiner will agree that anticipation can only be established by a single prior art reference which discloses each and every element of the claimed invention.² Moreover, "[t]he identical *invention* must be shown in as complete detail as is contained in the

¹ Page 6, lines 6 – 7 of the final Office Action of August 09, 2007.

² See, *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984).

patent claim.”³ It is not enough that the reference discloses all the claimed elements of the invention in isolation. Rather, as stated by the Federal Circuit, the cited art reference must disclose each element of the claimed invention “arranged as in the claim.”⁴

Claim 1 is directed to a gas-phase fluidized-bed reactor. The reactor must have no internal heat exchanger in the reactor chamber. The reactor must comprise a single reactor chamber with specific features, a circulation gas line, a circulation gas compressor, and a cooling device. Moreover, the claim requires these components to be interconnected in a specific way. To help facilitate consideration of claim 1 as a whole, Applicants would like to discuss: (1) the specific features of the single reactor chamber, and (2) the manner in which the components must be interconnected to form the overall gas-phase fluidized bed reactor that is claimed.

Required Features of the Single Reactor Chamber: The single reactor chamber according to the present invention must be in the form of a vertical tube. This vertical tube must have a region of transition in its lower section. The region of transition must be adapted for transitioning the reaction gas from a circulation gas line into the reactor chamber, and must be designed such that either no gas distributor plate is present, or such that a gas distributor plate is present in which gas orifices occupy more than 50% of the total surface area of the gas distributor plate. The lower section of the vertical tube must be followed by a reaction zone. The reaction zone of the vertical tube must be followed by a calming zone in the upper section of the tube. Only a single reactor chamber meeting all of these important features is eligible to qualify as the single reactor chamber according to the present invention.

Required Interconnections between the Components: First, the circulation gas line must be adapted to convey a reaction gas from the calming zone of the single reactor having each feature discussed above to the region of transition of the same single reactor. Second, the circulation gas compressor and the cooling device must be sited in the circulation gas line. Third, the circulation gas line must be connected to the lower section of the reactor chamber. Finally, the circulation gas line must be directly connected to the upper section of the reaction chamber.

³ *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989), (emphasis added).

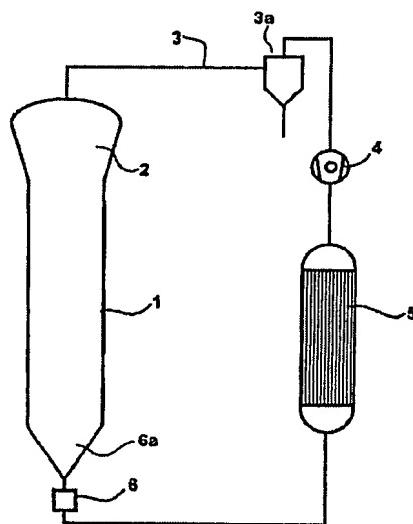
⁴ *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), (emphasis added).

Based on these requirements, a person of ordinary skill in the art would understand that claim 1 differentiates between two types of connections between the circulation gas line and the single reactor chamber: a connection, and a direct connection. Again, the claim makes clear that the circulation gas compressor and the cooling device must be sited in the circulation gas line. In this context, a skilled artisan would immediately understand the difference between:

- the circulation gas line being connected to the lower section of the reactor chamber, and
- the circulation gas line being directly connected to the upper section of the reaction chamber.

Especially in light of Fig. 1, reproduced below for the Examiner's convenience, a skilled artisan would understand that gas circulation line (3) is directly connected to the upper section of the reaction chamber. A skilled artisan would understand that gas circulation line (3) is connected (though not directly connected) to the single reaction chamber by virtue of the line's connection with components other than the reaction chamber. The Examiner should also note that in order to avoid any ambiguity claim 1 specifically refers to circulation gas line (3).

FIG.1



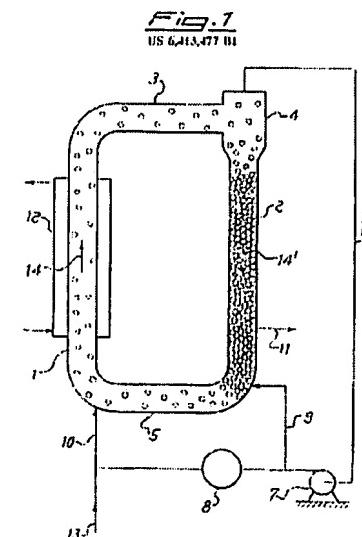
The Examiner concludes on the basis of Figure 3 of the *Govoni et al.* reference that "the gas circulation line 71 and 81) is connected to the lower section of a single

reactor chamber and is directly connected to the upper section of the same reactor....”⁵

To the contrary, line 71 of the *Govoni et al.* reference cannot be characterized as a “gas circulation line.” Such a conclusion would require use of impermissible hindsight reasoning to retrofit the teachings (and, in fact, the terminology) of the present application to a single illustration (Fig. 3) of the *Govoni et al.* reference while simultaneously disregarding the written description provided by *Govoni et al.*, which clearly explains that line 71 is not a gas circulation line. A skilled artisan at the time the present invention was made would not have had the benefit of the present application, and so would not have had the benefit of hindsight. More importantly, a skilled artisan would have considered the entire disclosure of *Govoni et al.*.

Before going further, Applicants would like to point out that line 71 is an embodiment of line 21 as shown in Figure 2 of the *Govoni et al.* reference. As stated in the written portion of the reference, “[t]he first line 21 can be horizontal or have a slope in the direction of gravity in order to facilitate discharge of polymer (see the configuration of the line 71 in FIG. 3).”⁶ It should be clear that lines 21 and 71 are not gas circulation lines. Lines 36 and 81 are recycle lines. Lines 21 and 71 are adapted to facilitate discharge of polymer from the first reactor to the separator.

A skilled artisan would have been able to correlate Figures 2 and 3 with Figure 1, especially in light of the written description provided. *Govoni et al.* provide the following explanation referring to Figure 1. “The two polymerization zones [1 and 2] are appropriately interconnected by the sections 3 and 5.”⁷ Moreover, “[t]he gaseous mixture leaving the separation zone 4 is compressed, cooled and transferred ... to the first polymerization zone 1. This transfer can be effected by means of a recycle line 6 for the gaseous mixture, equipped with means for the compression 7 and cooling 8”⁸



⁵ Page 6, lines 11 – 13 of the final Office Action of August 09, 2007 (emphasis added).

⁶ Column 11, indicated lines 29 – 31 of *Govoni et al.* (US 6,413,477).

⁷ Column 5, indicated lines 66 - 67 of *Govoni et al.* (US 6,413,477).

⁸ Column 6, indicated lines 34 – 40 of *Govoni et al.* (US 6,413,477).

A skilled artisan would have understood that section 3 of Figure 1 corresponds with lines 21 and 71 of Figures 2 and 3, respectively. According to *Govoni et al.* lines 3, 21 and 71 are not gas circulation lines, but are polymerization zone interconnecting lines adapted to facilitate discharge of polymer from the first reactor to the separator. A skilled artisan would never have confused these lines with the gas recycle lines (line 6, line 36, and line 81). Thus, the Examiner's characterization of line 71 as a gas circulation line is erroneous.

More importantly, *Govoni et al.* fail to disclose each element of the claimed invention "arranged as in the claim[,"]⁹ because *Govoni et al.* fail to disclose a circulation gas line:

- (1) that is directly connected to the upper section of a reaction chamber that possesses all of the required features of the single reactor chamber according to claim 1, and
- (2) is also connected to the lower section of the reactor chamber possessing all of the required features of the single reactor chamber according to claim 1.

On the basis of this important distinction, the Examiner will surely agree that the *Govoni et al.* reference does not anticipate the present invention.

Additionally, the *Govoni et al.* reference fails to disclose a circulation gas line that is adapted to convey a reaction gas from the calming zone of a reaction chamber that possesses all of the required features of the single reactor chamber according to claim 1 to the region of transition of that same reaction chamber. The Examiner has stated that "the circulation gas line (71 and 81) is adapted to convey a reaction gas from the calming zone to the region of transition...."¹⁰ First, as discussed above, it is clearly erroneous to characterize line 71 (or line 21) as a circulation gas line. Second, the *Govoni et al.* reference does not show line 71 connected to a reaction chamber that possesses all of the required features of the single reactor chamber according to claim 1. Figure 3 shows line 71 connected to a reactor that lacks a calming zone. Indeed, line 71 is a polymerization zone interconnecting line adapted to facilitate discharge of polymer from the first reactor,

⁹ *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), (emphasis added).

¹⁰ Page 2, lines 14 – 15 of the final Office Action of August 09, 2007.

which lacks a claming zone, to the separator 72. Thus, even if line 71 were erroneously characterized as a gas circulation line, the cited reference fails to disclose each element of the claimed invention "arranged as in the claim."¹¹ Of course, it should be clear that line 81 is not directly connected to the upper section of a reaction chamber that possesses all of the required features of the single reactor chamber according to claim 1. In response, it might be tempting to refer to column 11, lines 25 – 28 of *Govoni et al.*, which state that "[t]he upper region of the first reactor 20 can have a cylindrical shape with a diameter equal to that of the reactor or preferably can be of frustoconical geometry with the broad end uppermost."¹² However, reference to this section of the reference would not compensate for the fact that the reference fails to show each element of the claimed invention "arranged as in the claim."¹³ The present anticipation rejection cannot properly be maintained.

Additionally, the *Govoni et al.* reference fails to disclose a gas phase fluidized-bed reactor for polymerizing ethylenically unsaturated monomers, which comprises a single reaction chamber having all of the required features of the single reactor chamber according to claim 1 (see the discussion above regarding the many required features), and wherein the region of transition is designed such that either no gas distributor plate is present, or such that a gas distributor plate is present in which gas orifices occupy more than 50% of the total surface area of the gas distributor plate.

The examiner has pointed out that *Govoni et al.* discloses a configuration in Fig. 3 and at column 10, line 60 – column 11, line 6, "wherein there is no gas distributor plate within [a] reactor."¹⁴ Quite simply, however, the reactor to which the Examiner refers does not possess all of the required features. While Fig. 3 of *Govoni et al* shows a section 62 which does not have a gas distributor plate, section 62 is not part of a single reaction chamber that possesses all of the required features of the single reactor chamber and that is interconnected to the other components as required by claim 1. Thus, section 62 is not equivalent to the region of transition claimed in the present invention, and the disclosure

¹¹ *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), (emphasis added).

¹² Column 11, lines 25 – 28 of *Govoni et al.* (US 6,413,477).

¹³ *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), (emphasis added).

¹⁴ Page 2, lines 17 – 18 of the final Office Action of August 09, 2007.

of *Govoni et al.* does not anticipate the present invention. Again, in order for an anticipation rejection to be properly maintained, it is not enough that the reference discloses all the claimed elements of the invention in isolation. Rather, the cited reference must disclose each element of the claimed invention “arranged as in the claim.”¹⁵

For at least these reasons, the present rejection should be withdrawn. Independent claim 16, shares the features of claim 1 discussed above, and all other claims depend either from claim 1 or from claim 16.

Regarding Rejection II:

The Examiner should withdraw the rejection of claims 1, 3, 4, 6, 10, 16, 18 – 20 and 23 under 35 U.S.C. §103(a) over *Govoni et al.* (US 6,413,477).

Again, the Examiner has stated that because the transitional phrase “comprising” is used in the claim, “the reference can include more than what is contained in the claim language.”¹⁶ Thus, it seems that the Examiner is suggesting that at the time the present invention was made, a skilled artisan would have found it obvious to modify the *Govoni et al.* process/apparatus on the basis of:

- Column 11, lines 25 – 28, which states that “[t]he upper region of the first reactor 20 can have a cylindrical shape with a diameter equal to that of the reactor or preferably can be of frustoconical geometry with the broad end uppermost[,]”¹⁷ and
- Column 10, lines 63 – 67, which states that “the gas distributor means in the first reactor 60 can be replaced by a cylindrical line 65, through which the gas flows at high velocity and which is connected to the reactor 60 by a frustoconical section 62”¹⁸

Even if these modifications were made, the resulting process/apparatus would not meet all of the claim limitations. As discussed above, the claims require a circulation gas line:

¹⁵ *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983), (emphasis added).

¹⁶ Page 6, lines 6 – 7 of the final Office action mailed August 09, 2007.

¹⁷ Column 11, lines 25 – 28 of *Govoni et al.* (US 6,413,477).

¹⁸ Column 10, lines 63 – 67 of *Govoni et al.* (US 6,413,477).

- (1) that is directly connected to the upper section of a reaction chamber that possesses all of the required features of the single reactor chamber according to claim 1, and
- (2) is also connected to the lower section of the reactor chamber possessing all of the required features of the single reactor chamber according to claim 1.

As already discussed, line 3, line 21, and line 71 cannot be characterized as circulation gas lines. The Examiner has not suggested that a skilled artisan would have found it obvious to eliminate separator 4, 22, or 72, and directly connect recycle line 6, 36 or 81 to the first reactor. Indeed, the Examiner has good reason not to make such a suggestion. *Govoni et al.* emphatically stress the importance of a circulation of polymer particles between two polymerization zones, stating, for example, that

"[t]he process is characterized in that the growing polymer particles flow through the first of said polymerization zones under fast fluidization conditions, leave said first polymerization zone and enter the second of said polymerization zones through which they flow in a densified form under the action of gravity, leave said second polymerization zone and are reintroduced into said first polymerization zone, thus establishing a circulation of polymer between the two polymerization zones."¹⁹

Clearly no apparent reason existed for a person of ordinary skill in the art to eliminate the second polymerization zone and thereby eliminate the circulation of polymer particles between two polymerization zones. Of course, if no apparent reason existed to eliminate the second polymerization zone, then no apparent reason existed to directly connect recycle line 6, 36 or 81 to the first reactor. Such a modification would be nonsensical. The proposed modification, therefore, does not meet all of the claim limitations. The claimed invention is unobvious over *Govoni et al.*, and this rejection should be withdrawn.

Regarding Rejection III:

¹⁹ Column 5, indicated lines 14 – 22 of *Govoni et al.* (US 6,413,477).

The Examiner should withdraw the rejection of claims 7, 8, 21 and 22 under 35 U.S.C §103(a) over *Govoni et al.* in view of *Lubbock* (US 2,636,712). The Examiner cites *Lubbock* in an attempt to compensate for the fact that “*Govoni et al.* fails to disclose a closable flap with holes at the region of transition....”²⁰ *Lubbock* does not compensate for the shortcomings discussed above, and therefore this rejection should also be withdrawn.

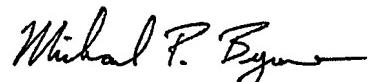
In Conclusion:

The present application is in condition for allowance. Again, applicants are thankful for the Examiner’s diligent efforts to advance this application to allowance, and request favorable action in this matter. In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner is welcome to contact the undersigned by phone to further the discussion.

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²⁰ Page 5, lines 1 – 2 of the final Office action mailed August 09, 2007.